

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

M. Hayakawa et al.

Group Art Unit: Not Assigned

Application No.: Div. of 09/583,919

Examiner: Not Assigned

Filed: November 12, 2001

Attorney Dkt. No.: 107350-00004

For: COAGULATING SEDIMENTATION APPARATUS

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

Date: November 12, 2001

Sir:

Prior to initial examination of the application, please amend the above-identified application as follows: (a marked-up version is attached hereto)

IN THE CLAIMS:

Please cancel claims 1-9.

Please amend claims 10-14 as follows:

10. (Amended) A coagulating sedimentation apparatus for precipitating and separating suspended solids, coagulated flocs or the like in a liquid to be treated, so as to clarify said liquid, said sedimentation apparatus comprising:

a sedimentation tank;

a chamber vertically disposed within said tank concentrically therewith, for introducing said liquid therein;

a distributor for distributing said liquid from said chamber into a sedimentation space between said tank and said chamber; and

a plurality of annular troughs concentrically arranged in an upper portion of said tank.

11. (Amended) A coagulating sedimentation apparatus according to claim 10, wherein said plurality of annular troughs are positioned and dimensioned such that weir parts of all said plurality of annular troughs into which a clarified liquid spills out have a substantially identical overflow liquid load.

12. (Amended) A coagulating sedimentation apparatus according to claim 10, wherein said plurality of annular troughs comprise an annular trough with a larger diameter disposed along a side wall of said tank, and an annular trough with a smaller diameter disposed in an intermediate portion between said side wall of said tank and said chamber.

13. (Amended) A coagulating sedimentation apparatus according to claim 12, wherein said plurality of annular troughs are positioned and dimensioned so as to satisfy the following expression:

$$\frac{\pi\{D_1^2 - [(D_2 + D_3)/2]^2\}}{\pi D_2} = \frac{\pi\{[(D_2 + D_3)/2]^2 - [(D_3 + D_4)/2]^2\}}{\pi D_3}$$

$$= \frac{\pi\{[(D_3 + D_4)/2]^2 - R_1^2\}}{\pi D_3}$$

wherein D_1 is the inside diameter of the side wall of the tank, D_2 is the inside diameter of the inner weir part of the annular trough with a larger diameter, D_3 is the outside diameter of the outer weir part of the annular trough with a smaller diameter, and D_4 is the inside diameter of the inner weir part of the annular trough with a smaller diameter, and R_1 is the outside diameter of said chamber.

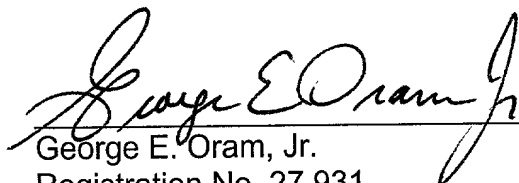
14. (Amended) A coagulating sedimentation apparatus according to claim 10, wherein said chamber is adapted to be fed with an additive, and to mix said liquid and said additive for coagulating the suspended solids or the like in said liquid.

REMARKS

Claims 10-14 are pending in this divisional application. By this Amendment, claims 1-9 are deleted. Claims 10-14 are amended to more broadly claim the invention to which the applicants are entitled. Support for the invention is clearly present in the specification and drawings as filed. No new matter is being added.

Please charge any fee deficiency or credit any overpayment to Deposit Account No. 01-2300.

Respectfully submitted,


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MARKED-UP VERSION OF CLAIMS

10. (Amended) A coagulating sedimentation apparatus [according to claim 1, further comprising a plurality of annular troughs concentrically] for precipitating and separating suspended solids, coagulated flocs or the like in a liquid to be treated, so as to clarify said liquid, said sedimentation apparatus comprising:

a sedimentation tank;

a chamber vertically disposed within said tank concentrically therewith, for introducing said liquid therein;

a distributor for distributing said liquid from said chamber into a sedimentation space between said tank and said chamber; and

a plurality of annular troughs concentrically arranged in an upper portion of said tank.

11. (Amended) A coagulating sedimentation apparatus according to claim [1] 10, wherein said plurality of annular troughs are positioned and dimensioned such that weir parts of all said plurality of annular troughs into which a [supernatant in said sedimentation space within said tank] clarified liquid spills out have a substantially identical overflow liquid load.

12. (Amended) A coagulating sedimentation apparatus according to claim [1] 10, wherein said plurality of annular troughs comprise an annular trough with a larger diameter disposed along a side wall of said tank, and an annular trough with a smaller diameter disposed in an intermediate portion between said side wall of said tank and [mixing] said chamber.

13. (Amended) A coagulating sedimentation apparatus according to claim [3] 12, wherein said plurality of annular troughs are positioned and dimensioned so as to satisfy the following expression:

$$\frac{\pi\{D_1^2 - [(D_2 + D_3)/2]^2\}}{\pi D_2} = \frac{\pi\{[(D_2 + D_3)/2]^2 - [(D_3 + D_4)/2]^2\}}{\pi D_3}$$

$$= \frac{\pi\{[(D_3 + D_4)/2]^2 - R_1^2\}}{\pi D_3}$$

wherein D_1 is the inside diameter of the side wall of the tank, D_2 is the inside diameter of the inner weir part of the annular trough with a larger diameter, D_3 is the outside diameter of the outer weir part of the annular trough with a smaller diameter, and D_4 is the inside diameter of the inner weir part of the annular trough with a smaller diameter, and R_1 is the outside diameter of [the mixing] said chamber.

14. (Amended) A coagulating sedimentation apparatus according to claim [1] 10, [further comprising a member secured to a mixer device, for supporting a center shaft] wherein said chamber is adapted to be fed with an additive, and to mix said liquid and said additive for coagulating the suspended solids or the like in said liquid.